Memorandum

To: *Jennifer LaPoma, EPA Region 2*
Elizabeth Franklin, USACE

From: *Keegan L. Roberts, Ph.D., PE, CDM Smith*
Scott Kirchner, CDM Smith

Date: *June 24, 2016*

Subject: *Summary of Oversight of Third SPME Sampler Installation Effort at River Mile 10.9*
June 3–5, 2016
Lower Passaic River Restoration Project

On behalf of the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), Kansas City District, CDM Federal Programs Corporation (CDM Smith) traveled to the River Mile (RM) 10.9 removal area on June 3, 4, and 5, 2016 and provided field technical oversight of the installation of solid-phase microextraction (SPME) samplers at 10 locations. Three samplers were installed at each of these 10 sample locations, including one each in the armor layer, the top of the reactive layer, and the underlying sediment bed. One set (one each in the armor layer, reactive layer, and underlying sediment bed) of duplicate samples were installed at one of the 10 sample locations. The approximate depth that each samplers was installed was:

- A deep sampler, installed in the underlying sediment at approximately 36 inches below the mudline (tagged with red zip ties and red tape for future identification)
- A mid-depth sampler, installed in the active layer at approximately 24 inches below the mudline (tagged with yellow zip ties and red tape for future identification)
- A shallow sampler, installed in the armor layer at approximately 16 inches below the mudline (tagged with green zip ties and red tape for future identification)

The field activities were conducted by AECOM on behalf of the Cooperating Parties Group (CPG). Prior to the previous sampler installation attempts, EPA and the CPG discussed several iterations of sample locations in an attempt to accommodate the CPG's logistical and health and safety concerns. These previously agreed-upon sample locations were again targeted during this deployment, as many of the CPG's original logistical and health and safety concerns still remained. The SPME samplers installed by AECOM are part of the initial performance monitoring event for the RM 10.9 sediment cap. The SPME

passive porewater samplers are intended to assess contaminant concentrations in the sediment bed, in the active cap layer, and in the armor stone layer of the RM 10.9 cap. This document notes that this is the third deployment attempt for the initial performance monitoring activities.

A brief summary of the work completed is as follows:

- On June 3, 2016, samplers were deployed at Stations 0606, 0607, 0609, and 0610.
- On June 4, 2016, samplers were deployed at Stations 0601, 0604, 0605, and 0608.
- On June 5, 2016, samplers were deployed at Stations 0602 and 0603, with a duplicate set of samplers deployed at Station 0603.

Photographs of field activities are presented in Attachment 1. A copy of the field logbook notes is provided in Attachment 2.

Summary of June 3, 2016 Field Activities

Personnel in Attendance

Keegan Roberts – CDM Smith
Yeqing Liu – CDM Smith
Chris McGauley – CDM Smith
Rick Purdy – AECOM
Jennifer Reed – AECOM
Joel Meunier – AECOM
Claire Murphy-Higgin – AECOM
Channing Hawkins – AECOM
Albert Macaulay – AECOM
Rei-Hua Wang – AECOM
Adam (*last name unknown*) - AECOM
Rachel MacPhee – AECOM

Prior to the start of the day's field activities, AECOM raised several safety considerations for the field effort during the tailgate safety briefing. The primary safety considerations included heat stress and combined water/mud levels when working on the cap. AECOM also noted that the sampler stick-ups would be cut to 6 inches above the sediment after installation.

AECOM generally organized their nine field personnel into three teams: one 3-person onshore sampler preparation and assistance team, and two 3-person sampler deployment teams. Three samplers were deployed at each sample station: one in the armor layer, one in the top of the reactive layer, and one in the underlying sediment bed. All sampler preparation and deployment activities were to be performed in accordance with the QAPP (AECOM 2015).

Sets of three samplers were installed at Stations 0606, 0607, 0609, and 0610 on June 3, 2016. Stations 0609 and 0610 were accessed with a boat as thick vegetation and fencing along the shoreline upland from Stations 0609 and 0610 prevented access from the shore. The field team was able to install samplers at all four sampling locations as the water level mostly remained below these locations until installation was complete. All portions of the samplers above the sediment bed were cut to approximately 6 inches above the sediment, except at Station 0609 where rising tides increased water levels to more than 6 inches above the sediment during sampler installation. As a result, the samplers at 0609 were cut approximately 1 or 2 inches above the water level instead of 6 inches above the sediment. This modification was approved by CDM Smith given the field constraints.

AECOM field personnel noted that a definitive armor stone layer was not encountered during the sampler installation at Stations 0606 and 0607. This lack of armor stone should be kept in consideration during the evaluation of data from these two locations.

AECOM relocated Station 0608 from the original proposed location 5 feet towards the river channel to help avoid hardpan in the sediment. CDM Smith approved this modification. Sampler installation was originally attempted at Station 0608 on this day. However, rising water levels submerged the first sampler before installation could be completed and installation efforts were aborted here for the day.

Summary of June 4, 2016 Field Activities

Personnel in Attendance

Keegan Roberts – CDM Smith
Yeqing Liu – CDM Smith
Chris McGauley – CDM Smith
Rick Purdy – AECOM
Jennifer Reed – AECOM
Joel Meunier – AECOM
Claire Murphy-Higgin – AECOM
Channing Hawkins – AECOM
Albert Macaulay – AECOM
Rei-Hua Wang – AECOM
Adam (*last name unknown*) - AECOM
Rachel MacPhee – AECOM

AECOM reiterated their site safety considerations during the daily tailgate safety briefing, and sampler installations progressed in the same manner as the previous day. AECOM installed the series of three samplers at Stations 0601, 0604, 0605, and 0608. Station 0608 was installed in the same “modified” location as was attempted on the previous day.

Summary of June 5, 2016 Field Activities

Personnel in Attendance

Keegan Roberts – CDM Smith
Yeqing Liu – CDM Smith
Chris McGauley – CDM Smith
Rick Purdy – AECOM
Joel Meunier – AECOM
Claire Murphy-Higgin – AECOM
Channing Hawkins – AECOM
Albert Macaulay – AECOM
Rei-Hua Wang – AECOM
Adam (*last name unknown*) - AECOM
Rachel MacPhee – AECOM

AECOM reiterated their site safety considerations during the daily tailgate safety briefing. AECOM installed the series of three samplers at Stations 0602 and 0603. A duplicate set of samplers was installed at Station 0603 per the QAPP (AECOM 2015) in the same manner as the previous 2 days. This location was chosen as the duplicate location by AECOM as it is one of the closest stations to shore and provided ease of access.

Table 1 presents the installation status at the ten sample stations for this deployment effort.

References

AECOM. 2015. Quality Assurance Project Plan, Lower Passaic River Restoration Project, River Mile 10.9 Post-Construction Monitoring – Draft. Rev. 1. December 4.

Table 1: Status of Proposed Sample Stations

Station	Status
0601	Installation completed 6/4/2016. Sample location same as in final station location proposal.
0602	Installation completed 6/5/2016. Sample location same as in final station location proposal.
0603	Installation completed 6/5/2016. Sample location same as in final station location proposal. Duplicate set of samplers were also installed at this station location on 6/5/2016.
0604	Installation completed 6/4/2016. Sample location same as in final station location proposal.
0605	Installation completed 6/4/2016. Sample location same as in final station location proposal.
0606	Installation completed 6/3/2016. Sample location same as in final station location proposal.
0607	Installation completed 6/3/2016. Sample location same as in final station location proposal.
0608	Installation completed 6/4/2016. Sample location moved 5 feet toward the river channel from proposed location. Relocation due to AECOM field team's concern regarding hardpan at the proposed location.
0609	Installation completed 6/3/2016. Sample location same as in final station location proposal.
0610	Installation completed 6/3/2016. Sample location same as in final station location proposal.

Attachment 1
Photographs of Field Activities

Photograph 1: All three samplers installed at Station 0610

6/3/2016

Photograph 2: Recording GPS location of second (i.e., yellow tagged) sampler at Station 0609

6/3/2016

Photograph 3: Installing second sampler (i.e., yellow tagged) at Station 0604

6/4/2016

Photograph 4: Using a bolt cutter to cut down the portion of the first sampler (i.e., green tagged) above the sediment at Station 0601

6/4/2016

Photograph 5: Capping third sampler (i.e., red tagged) at Station 0602

6/5/2016

Photograph 6: Measuring the distance between samplers at Station 0607

6/3/2016

Photograph 7: Samplers installed at Station 0606

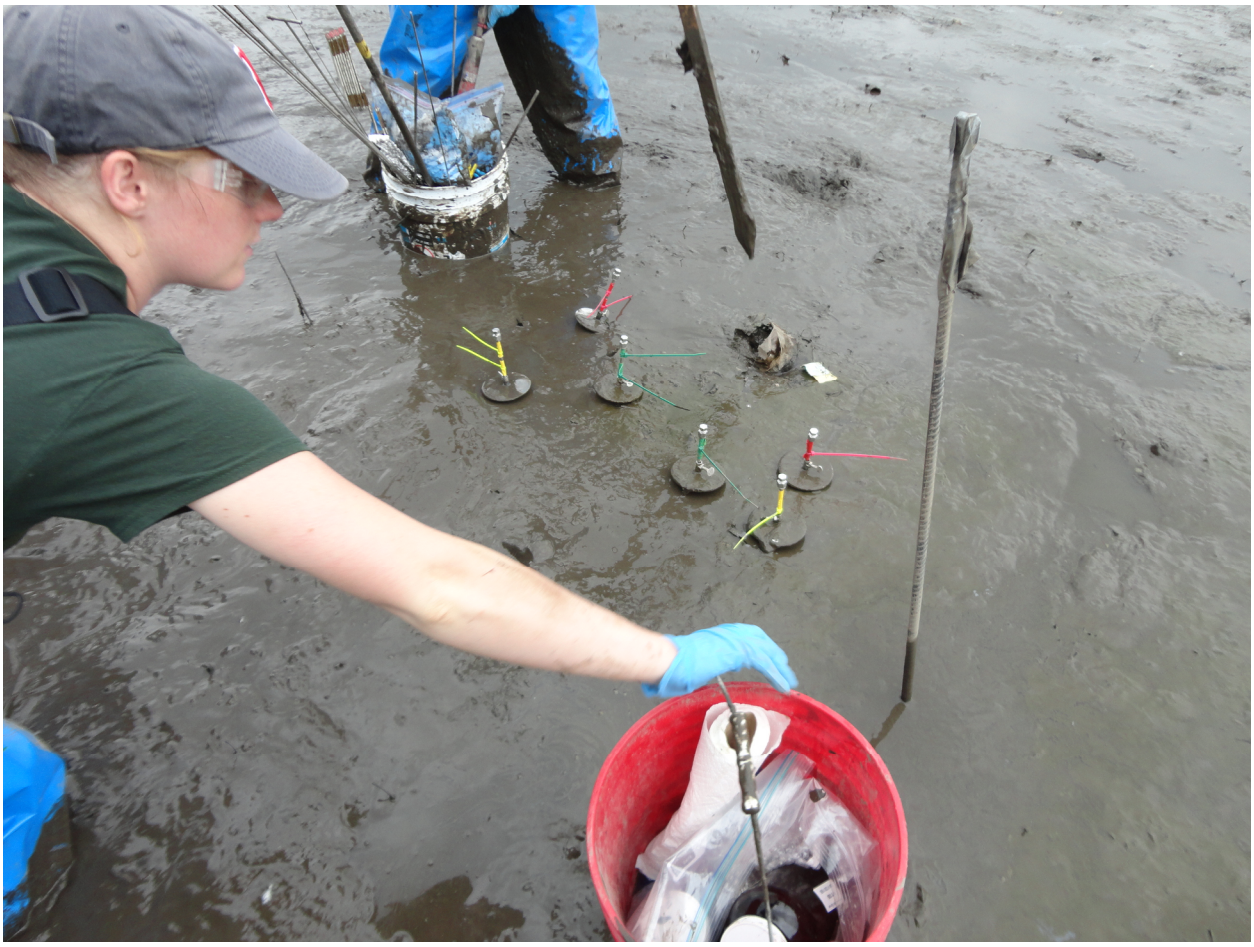
6/3/2016

Photograph 8: All three samplers installed at Station 0608

6/4/2016

Photograph 9: Tightening the cap of the third sampler at Station 0605

6/4/2016



Photograph 10: Samplers and duplicate samplers installed at Station 0603. Duplicate samplers have two bands of tape and two Zip ties as “tags”

6/5/2016

Attachment 2
Field Logbook Notes

12

Location LYNDHURST, NJ / PASSAIC Date 3/9/16

Project / Client USEPA-USACE / PASSAIC RM 10.9

SPME RETRIEVAL

1730 608 SEDIMENT SAMPLER IS STRAIGHT. FIBER LENGTH (mm):
10.6, 4.4, 7.9, 6.3, 7.0, 7.8, 11.6,
12.7, 5.4, 8.0, 6.9, 4.2, 12.3, 5.9,
12.1, 3.6, 13.1, 9.9, 5.7, 10.5, 10.9, 6.0,
10.8, 8.7, 8.4, 8.3, 7.6, 7.5, 9.4, 4.3,
11.1, 6.7, 5.5, 10.5, 4.3, 6, 4, 4.5, 5.0,
3.8, 5.2, 10.8, 5.3, 4.2, 3.1, 4.6, 2.8,
3, 4, 4.2, 9.4, 7.2, 11.4, 8.3, 13.2, 8.4,
10.2, 18.4, 26.6, 23.6, 26.1, 17.5, 34.8,
28.6, 19.4, 36, 9.3, 36.8, 29.6, 31.9,
27.3, 28.8, 28.5, 15.4, 10.4, 15.5,
34.3, 26.8, 82.9, 82, 15.1, 10.4,
11.5, 6.7, 11.0, 6.0, 4.9, 4.6, 11.7, 17.0,
5.6, 13.9, 6.0, 10.7, 8.2, 19.6, 19.1, 10.3,
25.1, 26.6

1815 ROBERTS LEAVES SITE.

END OF DAY

Keegan Adz 3/9/16

13

Location LYNDHURST, NJ / PASSAIC Date JUNE 3, 2016

Project / Client USEPA-USACE / PASSAIC RM 10.9

SPME INSTALLATION

0800 K. ROBERTS (NOTE-TAKER).
WEATHER: OVERCAST, LIGHT DRIZZLE, ~65°F

1000 AECOM PERSONNEL ACTIVE ON SITE: RICK PURDY, CLAIRE MURPHY-HIGGINS, JOEL MEUNIER, JEN REED, CHANNING HAWKINS, RACHEL MACPHEE, DARBY "MACAULAY (ALBERT), REI-HUA WANG

1030 CHRIS MCGAULEY (COM) ARRIVES.

1115 AECOM CONDUCTS SAFETY BRIEFING

1240 AECOM TO LOCATE LOCATIONS 0609 AND 0610, WHILE SAMPLER IS INSTALLED AT 0607. ROBERTS ACCOMPANIES AECOM TO 0609 AND 0610 (~~FEG~~ KLR 6/3 ROBERTS OBSERVES FROM BUCKHEAD).

1245 ROBERTS AGREES TO MOVE 0608 5FT TOWARDS CHANNEL TO HELP AVOID HARDPAN.

1258 LOCATE 0610

1313 LOCATE 0609

1350 COMPLETE INSTALLATION AT 0607

1450 COMPLETE INSTALLATION AT 0610

Rite in the Rain

14

Location LYNDHURST, NJ / PASSAIC Date 6/3/16

Project / Client USEPA - USACE / PASSAIC RM 10.9 SPME INSTALLATION

1458 MURPHY HIGGINS INFORMS ROBERTS THAT "STICK-UPS" FOR 0609 WILL HAVE TO BE SLIGHTLY HIGHER THAN FOR OTHER LOCATIONS DUE TO STANDING WATER. ROBERTS AGREES.

1521 COMPLETE INSTALLATION AT 0606

1601 0608: WAIT TILL TOMORROW DUE TO RISING TIDE

1623 FIELD TEAM PACKING UP. ROBERTS LEAVES SITE.

END OF DAY

Keegan 6/3/16

15

Location LYNDHURST, NJ / PASSAIC Date 6/4/16

Project / Client USEPA - USACE / PASSAIC RM 10.9 SPME INSTALLATION

1030 ROBERTS ARRIVES ON SITE. WEATHER: HUMID, PARTLY CLOUDY, STILL, ~75 °F

1130 AECOM ARRIVES: MCGAULEY AND LIU (COM) ARRIVE. LIU WAS ALSO ON-SITE YESTERDAY SAFETY BRIEFING HELD.

1400 AECOM DEPLOYMENT TEAM AT 0608 STILL AT LOCATION WAITING FOR TIDE TO FALL. TEAM HAS BEEN AT THIS LOCATION SINCE ~1230

1435 AECOM DEPLOYMENT TEAM STILL DEPLOYING SAMPLERS AT 0608. NOTE: SAME AECOM PERSONNEL ON SITE AS YESTERDAY.

1600 AECOM DEPLOYMENT TEAM MOVES TO STATION 0605

1715 DEPLOYMENT FINISHED AT 0605

1730 ROBERTS LEAVES SITE.

END OF DAY

Keegan 6/4/16

16

Location LYNDHURST, NJ / PASSAIC Date 6/5/16

Project / Client USEPA-USACE / PASSAIC RM 10.6

SPME INSTALLATION

1100	ROBERTS ARRIVES ON SITE. WEATHER: HEAVY RAIN
1145	MCCANLEY ARRIVES ON SITE.
1200	LIN ARRIVES ON SITE
1215	AECOM ARRIVES ON SITE
1305	AECOM CONDUCTS SAFETY BRIEFING. SAME AECOM TEAM EXCEPT JEN REED NOT HERE.
1340	ROBERTS ATTEMPTS TO INSPECT 0608, 0609, AND 0610. ALL SAMPLERS STILL COVERED BY WATER.
1440	0608, 0609, AND 0610 STILL COVERED BY WATER.
1450	AECOM MOBILIZES TO 0603. 0603 WILL BE DUPLICATE LOCATION.
1650	AECOM COMPLETES DEPLOYMENT AT 0602.
1748	ROBERTS LEAVES SITE.

END OF DAY

6/5/16

17

Location _____ Date _____

Project / Client _____

Rite in the Rain

Location Passaic RM 10.9 Date 6/3/16

Project / Client USEPA

11:25	Arrived onsite H&S meeting ongoing Samplers will be cut to 6in above sediment. Team to be ready at 12:30 See attendance list in K. Roberts logbook
1233	Team heads out w/ GPS to mark out 608, 609, & 610 locations
13:25	GPS done staking out sampling locations
13:37	Boat team gets dressed and prepares to sample at 610.
13:45	Boat team arrives at 610 with equipment
13:55	sledgehammering first sampler location into the ground. green
14:00	disk slid onto sampler and sampler cut @ ~6 inches above sediment w/ ~~bolt cutter~~ sample cutter
1405	Team member returns to onshore sample prep area to get additional supplies
14:11	Team member returns w/ bolt cutter
14:14	Cap screwed onto sampler
14:22	sledgehammering 2nd location

Location Passaic RM 10.9 Date 6/3/16

Project / Client USEPA

1425	Disk added to 2nd sampler
1427	Sampler cut short
1430	2nd Sampler marked as yellow
1433	Sampler cap tightened
1438	sledgehammering 3rd sampler location
1442	Disk tightened onto 3rd sampler and sampler is cut short
1446	Sampler marked as red sampler cap tightened
AS7	Boat crew packing equipment back onto boat to move to sampling location 609
1509	At sampling location 609. One team member is unable to cross the mudflat. Boat going back to sample loc 610 to retrieve her
	Current 609 sample loc is ~3 feet inland from original location due to depth limitations
1520	geotextile measure to be at least 2 ft down Rain in the Rain

Location Passaic RM 10.9 Date 6/3/16

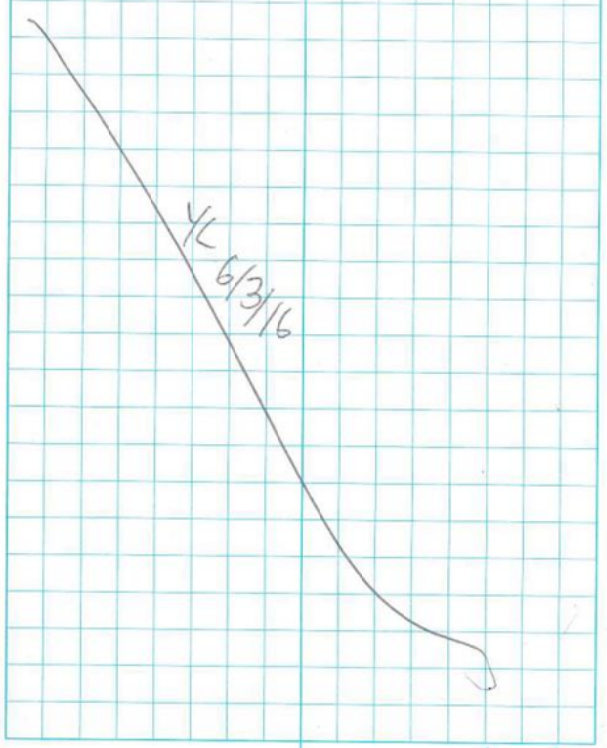
Project / Client USEPA

1525	stedg hammering 1st sampler at 609
1527	Sampler inserted in location sampler is tilted slightly at ~3° from the vertical issue w/ 6in above sediment still under water, Sampler will be cut a little above the water surface instead disk added to Sampler &
1535	Sampler is labeled green
1539	cap for sampler is screwed on
1540	Clair - returns to GPS 609
1545	stedg hammering 2nd Sampler location
1549	Sampler marked yellow and is cut down to a half inch above the water surface
1551	Sampler cap is screwed on
1559	stegehammered 3rd sampler location with extender to rock low enough depths
1602	sampler labeled red
1603	sampler tape removed to add disk

Location Passaic RM 10.9 Date 6/3/16

Project / Client USEPA

1608	Sampler cap is tightened on
1615	exit site end of day



Rite in the Rain

38

Location Passaic RM 10.9 Date 6/4/16

Project / Client USEPA

11:40	Arrived on site. No ~~AECOM~~ YL 6/4/16 ~~personnel yet.~~ COM Smith personnel Chris Magauley & Keegan Roberts also present. AECOM is setting up tent & equipment. See K. Roberts logbook for AECOM personnel list
12:20	AECOM H&S Meeting Biggest concern = heat stress
13:25	AECOM team reaches sampling loc 604
13:35	Sledgehammering 1st sampler location. Out screen was dislodged
1338	sledgehammer is caked with sediment. Field team attempts to shake/clean sediment off.
1342	second sledgehammer event of 1st sampler (new sampler)
1356	1st sampler capped & cut short 6 in above sediment (green)
14:00	2nd sampler sledgehammering
14:10	sampler measured - no need to cut short as it is already 6 in above sediment surface. sampler tube was bubbling out

Location Passaic RM 10.9 Date 6/4/16 39

Project / Client USEPA

	water when sledgehammer was removed. Sampler marked yellow
1416	Second sampler capped & tightened
1418	sledgehammering of 3rd sampler location
1426	Sampler labelled red. Cap is added and tightened. Sampler is slightly shorter than other two above sediment surface. No need to cut down (<6 in above sediment surface
1429	sampling team returns to set up area for break
1450	Field team heads to loc 601
1500	Sledgehammering first sampler location. Sampler is tilted at about 10-15° from the vertical and also seems wobbly
1510	sampler capped & labeled green
1513	sledgehammering 2nd location (# sampler #2)

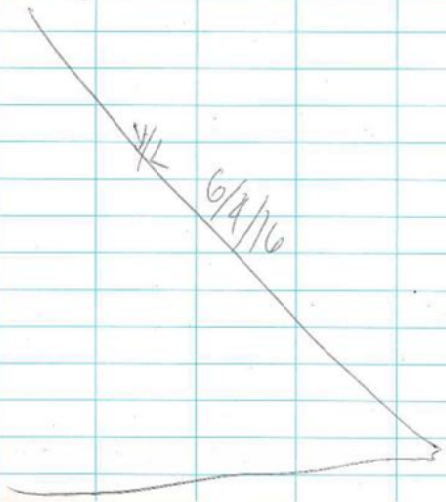
Rite in the Rain

40

Location Passaic RM10.9 Date 6/4/16

Project / Client USEPA

1523	Sampler labeled yellow
1525	Sampler relabeled to red and capped
1532	Sledge hammering 3rd sampler location
1539	Sampler labeled yellow and capped
1600	Team returned onshore after determining tide was advancing too fast
1630	Leave Site



41

Location Passaic RM 10.9 Date 6/5/16

Project / Client USEPA

1204	Arrive onsite K. Roberts & C. Mycek of CDM Smith are present
1215	AECOM begins setup after arriving
1305	AECOM H&S Meeting
1315	Tent set up begins
1525	Team heads out to Sampling Loc 602
1546	Sledge hammering 1st sampler location
1555	cutting short 1st sampler to 6in above sediment surface
1557	Bolt cutter is struggling with sampler. sampler tilts to about a 3°-5° angle due to hardpan
1600	Sampler labeled green and capped
1608	Sledge hammering 2nd sampler
1620	Labeling 2nd sampler yellow and capping (angled 15° to vertical)
1629	sledge hammering 3rd sampler (angled 10-15° from the vertical) ~~3rd sampler height above the~~

6/5/16

Rite in the Rain

Location Passaic KM 10.9 Date 6/5/16

Project / Client USEPA

YL 6/5/16

~~Sediment is only ~ 2 inches~~

1633 Sledgehammer prew is stuck in the sediment. Team reaches into sediment to dislodge. Digging into the sediment has caused the other samplers' disks (yellow and green) to be suspended above the sediment surface (½ inch & 1 inch above respectively)

YL 6/5/16 1639 cutting sampler down to 6 inches above sediment surface measured as 6 inches starting from the disk.

YL 6/5/16 1641 Sampler marked red and capped.

1647 AECom team leaves sampling location 602

1726 decon of equipment

1740 Left Site

YL 6/5/16

Location Date

Project / Client

Rite in the Rain

12
Location ______ Date ______
Project / Client ______

Location Lyndhurst NJ / Passaic River Date 6/3/16 13
Project / Client USEPA-USACE / Passaic RM 10.9
SPME Installation

1055: CM Arrives On Site. Meets Keegan
Personnel: Jon Reed, Rachel McFee, ~~Darby~~ Cal
Chris McGauley (CM-CDM), Keegan Roberts (KR-CDM Fed)
Albert McCauley, Rei-Hua Wang, - See Keegan's for full list.
PPE: Tyvek, Waders, Safety Glasses
Weather: Overcast, 60-70°F
1117: H&S Tailgate Meeting held by Rick of AECOM
Schedule detailed by Claire (FTL-AECOM)
1135 H&S Meeting Concluded
1240 AECOM Begins Moving Personnel & equipment to sampling location 15A-0607. This Sampling Location will be installed as an example to all field Crew.
1245: AECOM Joel indicates that No Armor layer exists at 15A-0607, and Sediment Depth to geotextile is 10.5 inches. Measured by probing Sediment with rebar until Resistance of geotextile encountered. Sediment on Rebar is measured for length using collapsible wooden ruler. "Probing w/ Rebar" Soft Sediment to Sand is 7" bgs.
3x 3' Samplers Currently exist on Rocks on River's Bank.
1258: "Armor layer" Sampler installed (?). The tip was installed, Joel Collects actual Sampler from Rocks, unwraps it from foil, Slides it down the inside

[illegible]
Rite in the Rain

Location Lyndhurst, NJ / Passaic River Date 06/03/16

Project / Client

of the slide hammer. The metal disc plate is slid over the small aluminum Tube, the nut was tightened with pliers, The outer Tube was cut with a pipe cutter. Inner tube is raised ~ 1 inch, and inner tube was cut with bolt cutters. The inner tube now is inside the outer tube entirely. The outer tube is filled with water from a syringe, The Swage lock was then applied carefully, and tightened Using Pliers. Shallow Sampler is installed and tagged using Green Zip Tie and green tape. Personal opinion is that the tubes/sampler appears loose. Moves easily when touched/bumped. Plate is flush with Sediment and Sampler with Swage lock goes to 7" down plate. (or 7.5" above plate. -@ 13:15

1315 Joel Re-installing Slide hammer hammer to install Active layer Sampler. next. Joel Spraying off Slide hammer Shoe with Water to clean it Using a Spray bottle labelled "DI". Also Cleaning the T-bar

1320: Joel installed new tip to Slidehammer, pushed it down to geo textile, then put tape on Slidehammer 9 inches above the Sediment to measure depth of installation Beyond geotextile. Joel used the T-Bar to dislodge point from Bottom of Slide hamer. The distance between Samples was measured and found to be 9.5 inches.

Location Lyndhurst, NJ / Passaic River Date ~~06/03/16~~ 06/03/16 15

Project / Client

1330: Joel Cuts outer-tube with pipe cutter. ~~Cut~~ lifts inner tube with hand and cuts with Bolt Cutters. Releases inner tube so it goes back into outer tube. fills tube with water from A syringe. Zip Tie (yellow) and tape (yellow) applied to outside of outer tube and the Swage lock applied using hands then tightened using pliers (2 pair) tightened in opposite directions. Outer Tube is 4" above Surface.

1337: Joel begins to slide hammer to geotextile interface. Measures on slide hammer 21 inches above sediment & applies tape. Hammers down to 22" bgs, removes hammer inserts T-Bar to dislodge point. T-Bar not all the way in before slidehammer outer slide hammer begins to be removed (heard & saw the T-Bar fall deeper into hammer Barrel after hammer barrel was already being removed), so potentially the point is not at 22" bgs. inserts inner tube, fills with water. Puts on plate, tightens w/ pliers. Applies Swage lock after Zipties (Red) and tape. Outer Sampler is 11.5 inches from medium Sampler Deep sampler sticks up 3.5 inches

16

Location Lyndhurst, NJ/Passaic River Date 06/03/16

Project / Client

1412. Mobilized to Sample location ~~DHSA~~-0606. Joel measuring Sediment depth = 13.5" from Surface to resistance (top of Sand). Joel says 4" Sand, then geofabric following Sediment. No certain Armor layer encountered. After poking around with Rebar several chunks identified, but no definitive Armor layer IDd by Joel. Joel Posits the Cap installers did a poor job. Truth of the matter unknown. ~~It~~ Will update when Slide hammer employed.

1425. Joel installs Slide hammer Point. Installs Slide hammer point to top of geotextile. Installs ~~a~~ Outer Tube into Slidehammer. Rides out Point w/ T-Bar. Removes Slide hammer. Installs metal Plate, tightens screw by hand then w/ pliers. Installs green Zip tie & Tape on Sample outer Tube. ~~Joel Changes his Gloves before installing inner tube.~~ Joel Changes his glove to install next, medium depth, point. Posites Slide hammer to top of Geotextile, applies tape 6" above sediment onto slide hammer. Hammers point 7" below geotextile. Isn't installing inner sampler in first point because Bolt Cutters are not handy to cut to length after install.

Chris Mordy

17

Location Lyndhurst, NJ/Passaic River Date 06/03/16

Project / Client

1438. 2nd sampling point installed to depth, T-Bar Applied, outer barrel removed. Outer Barrel cleaned with Sprayy bottle before installing new point and driving deep sample outer Tube.

0245. Joel Begins driving next sampler (deep). Armor layer was encountered at this location. Fabric ~22 inches below sediment surface, Armor encountered at Approximately 18" bgs (Roughly 4", Approximately - per Joel) Target depth is 20", Tape Applied 15.5" active layer below geotextile, per Joel, due to Strata change felt while hammering. Joel going to Remove Slide hammer Barrel with 3" before tape, Such that point is installed 17" below geotextile. Joel Calling ~~Rick~~ Claire on for Clarification on depth of Screen Setting (@1454). Conclusion Reached: going to Continue driving point to 21" below geotextile. Outer tube installed into Barrel, T Bar installed for Removal of Slide hammer Barrel. Plate installed after Removing barrel.

Chris Mordy

Ritter in the River

18

Location Lyndhurst, NJ / Passaic River Date 6/3/16

Project / Client

SPME Installation

None of the deep sampler cut off at top. Cap installed at end of tube. Following water input. Middle sampler had 20.5" cut from top (starting length of 48"). Joel Puts on fresh gloves to install inner sample tube for middle depth. Installs the Cap using hands then wrenches. (Both deep and middle so far). Middle outer tube sticks out of Sediment 5" (five inches). Deep Sampler Sticks above surface 7" inches. 12.5" of Shallow sampler outer tubing cut off (original length 36"). Distance from Shallow - Mid - Deep is 13.5", 16.5".

1520: All Samplers at 606 installed.

1548: Mobilized to "608" location. Joel begins by measuring sediments with Rebar. Tide has started to come in. ~1 inch Sediment, 4in. Sand, then Armor layer encountered. Geofabric encountered 12.5" bgs. Slide hammer point hammered in at approximately 60° ∠ angle. T-Bar used to remove Barrel but leave point & outer Tube. This location is lost? The outer Tube went all the way in and was submerged under water when Slide hammer Barrel was Removed.

Chris McGourley

19

Location Lyndhurst, NJ / Passaic River Date cm 11/06/03/16

Project / Client USEPA-USACE / RM 10.9 (Passaic)

1600: Calling it Quits at this location due to quickly Rising tide, Submerged sample tube, and lost point + screen. We're unable to Continue installing points for the day, I believe. The Rebar was used to clear a path for the Slide hammer + through the armor layer, and this the reason for the angled attempt at installation. Location Aborted for the day.

1620: Chris McGourley leaves Site to Return Tomorrow, 6/4/16 at 1100.

Rite in the Rain

20

Location Lyndhurst NJ/Passaic River Date 6/4/16

Project / Client USEPA - USACE / Passaic RM 10.9 SPME INSTALLATION Chris McCauley

11:35 CM arrives on-site after Picking up Water for Decon. Keegan already on Site, Ching Ching Shortly after.

Personnel: Ching Ching, Chris McCauley, Keegan Roberts (CDM Smith)

Weather: 70-80°F, ~~Cl~~ Partly Cloudy, Sunny

PPE: Waders, Tyvek, Gloves, Safety Glasses

1220: AECOM Holds HAS Meeting.

1305: Mobilizing to ISA-0608. Joel uses Rebar to navigate through Armor layer but water is Still over the Sediment. Waiting for tide to go out to take accurate measurements before Proceeding.

1430: Tide is almost low enough to not be covering locations. We are now beginning work to install the Samplers. Two locations have Clearings through the armor to the geotextiles (Rebar) to begin installing Samplers

1439: 15.5 inches to geotextile. Approx 4" 4.5" Sand and 11" armor.

1444: installing point + Screen into Barrel. Hammer Barrel installed. Henry Sampler ("over tube" from yesterday) measured at 36" long. installed inside barrel, Barrel removed w/ T-Bar inside to keep Henry Sampler in place. Plate is installed around Henry Sampler + Tightened w/ pliers. Green Tape applied, then green Ziptie. The Henry Sampler is Cut with pipe Cutter. Cut part of Henry Sampler is 20 inches.

Chris McCauley

21

Location Lyndhurst NJ/Passaic River Date 06/04/2016

Project / Client

1455: Inner Rod w/ SPME fibers pulled up slightly then Cut w/ new bitcutters. Dip in SUPER DI water applied to Henry Sampler with Syringe.

1440: Metal Cap applied to Sampler. Henry Sampler is Sticking up above Plate 4" after Cutting and applying Cap.

1443: installing new point on Slide hammer to begin installation of medium depth Sampler. Using Rebar to measure depth to geotextile. 6" Sand, 8" Armor., 1.5" native sediment. Revised to 4.5" Sand. Rest remains. Using T-Bar to measure how far down it goes in Barrel. 44.5" acs. Currently Point is 30" below because 14" of Barrel above ground. Going to Push 2" more to make this point our deep sample location. Point @ 32" BGS. T-Bar used to Remove Barrel.

Henry Sampler appears to be installed at a Slight angle. (see photo). Henry Sampler is not to be cut. Remains above ground approx. 4 inches. Plate installed, tightened with pliers. Tape + Ziptie (Red) applied to denote deep Sampler.

No Cutting of inner Rod. Water applied w/ Syringe

Chris McCauley

Rite in the Rain

The Henry Tube Keeps accepting the Water. The Syringe has been Refilled and emptied into Henry Tube approximately 6 times. Syringe inserted into top of Henry Sampler and Water poured into open top of Syringe like a funnel. Henry Tube Stopped accepting water & Cap applied w/ pliers.
1503: Began opening hole through armor w/ Rebar b/w first 2 points, Changed tack towards the Water. 14.5" to fabric. 36.5" Henry Tube, 2" Sediment 3.5" Sand. 9" of Armor. Point inserted into Hammer. Point installed to 21.5" Below Grade, Henry Tube installed. T-Bar used to Remove Barrel While Point remains in place. Green & Red pole installed 12.5" apart. Medium Sample point installed at an angle (~75°)
1515: Adam leaves location. Not feeling well (heat). Claire Walks him back. Plate installed & Tightened, Yellow tape & Zip tie Applied. Henry Sampler cut w/ pipe cutter. length of cut Henry tube: 8.5" length of Sampler Sticking above grade: 6.5 Using the syringe as a funnel to apply DI water again Applying Cap w/ Wrenches. This location Complete. Distance b/w Red & yellow is 12".

Chris McGeady

1603 "6" to armor layer (on Rebar). 10" Muck, 6" Sand @ 15A-0605. Adam was Replaced w/ Darby (Macaulay), Joel & ~~Rebecca~~ Rachel Consist of the Rest of the team. 10.5" Armor, Geotextile encountered @ 26.5" below Surface of Muck. Measuring on the Slide hammer barrel 26.5" from tip of point & marking w/ tape. Rebar holding the hole open through Armor until Ready to use Slide hammer in same opening. Joel Remarks there's a Creepy guy in a blue Shirt on the Shore Watching. I confirm it's Just Keegan. Work Proceeds. Shallow Sample location Henry Sampler measures 48". Using T-Bar to Remove Barrel around Sampler & Point. Sprayed out the Barrel w/ Spray bottle. Installing the Plate over the Henry Tube. Henry Tube appears to be installed at a Slight Angle (~88°). Tightens Plate w/ Pliers, Applying Green tape & Zip ties to Sampler tube. Cutting Henry Tube with Pipe Cutters (Rotary). Joel holds the base plate to prevent Spinning while Cutting pipe (Henry Sampler). Cut henry Sampler length = 21". Joel uses Both Cutters to Cut Inner Rod.

Chris McG

 Location Lyndhurst NJ / Passaic River Date 6/4/16
Project / Client

Henry Tube Sticks above Surface 2" ~~in cm~~
Including Cap (which Joel just installed).
1620: Begin next Sampling Point. Sediment
thickness = 10.5". Armor layer follows.
thickness of Armor layer = 16.5in.
1629: Rebar used to Reach Geotextile at next location.
Measured 26.5" + 7" on Slide hammer barrel, marked
w/ tape (@ 33.5" from tip). Point hammered in until
33.5" Marking on the Barrel. Henry Sampler length
is measured to be 48" long initially. Used
Slide hammer to hold Henry Tube in place while
removing Barrel until Barrel was at end of Henry
Tube & T-Bar Can be employed. Spraying
out Barrel after Removal from Sampler. Applying
Plate Tape, Zip Tie (Yellow). Medium Depth
Sampler installed more vertical than Shallow depth
Sampler from my vantage, Still barely off kilter.
Cutting Henry Tube w/ Pipe Cutters. Removed
length of tube = 13" inches. Remaining
tube above plate/Sediment = ______ inches
~~Cap installed w/ Pliers after filling w/ water~~ · CM written too soon
Inner Tube Stuck, Won't easily pull up to be
Cut. Gets Cut. Cap now. Didn't add water
So I Reminded them. They Remove Cap, Add H_2O,
Replace Cap. ——— Cly Meg ———

Location Lyndhurst, NJ / Passaic River Date 6/4/16
Project / Client

1648: CM Reminds Aecom about the Water, necessitating
addition of water. They add H_2O to Yellow Sample
then add water to Green Sampler (initially forgotten
too.) Green, Shallow Sampler drinking the
water (taking a lot of it from the
Syringe-funnel). Tide is coming in as
well. ~15' from work area Currently.
Joel Replaces the Caps & tightens w/ pliers.
1454: Starting Next location (Deep) 10" to Sand
from Surface, 4.5" Sand, 12" Armor.
Geotextile encountered @ 26.5" bgs. Spraying
out end of Slide hammer Barrel w/ water before
attaching to Slide hammer. Measuring on Slide
hammer Barrel to depth ~~(43.5")~~ cm 45".
River Water now approx. 7' from Work
Crew & Rising. The entire Barrel is the
Correct length to deployment depth. No tape needed.
1700: Point Driven to depth. Removing Barrel from
Slide hammer. Henry Sampler Measured to
be 72" long. installed into Barrel. T-Bar
Used after Using the Channel locks & hands
to dislodge Barrel & keep Henry Tube in
Place. Joel installing the Plate, tightening
it with Pliers. River Water has Reached
Armorals ———

Rite in the Rain

26

Location Lyndhurst, NJ/Passaic River Date 6/4/16

Project / Client

The Work area.

1708: Ziptie & Tape Applied. Begin using Cutter. Stops, Moves it higher due to Rising River Water. Cuts Tube. Cuts inner Rods, fills with Water. Applies Cap. Length of Tube Cut off = 23". Samplers Deployed at location

1728: CM leaves Site.

Chris McGauley

27

Location Lyndhurst NJ/Passaic River Date 6/5/16

Project / Client USEPA - USACE / Passaic RM 10.9 SPME Installation

11:30: CM arrives on Site.

1215: AECOM Arrives On-Site.

Weather: Raining, 50-60°F (feels like)

PPE: Waders, Safety Glasses, Gloves, Tyvek

Personnel: Chris McGauley, Keegan Roberts, Ching Ching (Dixi Smith)

1305: Safety Meeting held by AECOM

1452: AECOM Mobilizing to Sampling location 15A-D603.

1455: Joel finds path through Armor with Rebar already for Measuring depths of constituents (of cap) and pilot holes for Slide hammer. from Surface to geotextile measures 23", 21", and 20.

Shallow Sample to geotextile is 20.5".

11.5" of sediment (Surface to Sand), 15.5" to top of Armor (4" of Sand), 5" Armor.

Joel began to insert Slide hammer w/ point into rebar hole, but thought better to measure on the barrel the depth to geotextile / ~~15.5"~~ 20.5" for Shallow Sampler. So he Could Stop when reached the geotextile. So he reached to bottom of Barrel in the Sediments, Measured along the barrel marked 20.5" on the barrel, Rested the Slide hammer vertical while he Rinsed off his tyvek & Gloves →

Chris McG

Rite in the Rain

28

Location Lyndhurst, NJ/Passaic River Date 6/5/16

Project / Client

1506: Joel drives the point to the mark on the slide hammer barrel. The Henry Sampler measures 48" initially. The Sampler inserted into Barrel, held steady while Barrel Removed. Plate installed on Shallow Sample Henry Tube. Tightened w/ Pliers. Henry tube wiped down w/ paper towel (Sediment from Barrel Removal appeared to be cause of Sediment on Sample tube. Green Tape & Zip tie applied to Sampler tube. Tube Cut w/ pipe cutters. Excess outer tube removed. Measures 24". Sample tube remains 3.5" above the Sediment. Syringe body used like funnel to fill Sampler with DI water from Amber 1L Jar. Cap installed on Sampler tube, tightened w/ pliers/Channellocks.

1518: 21" to geotextile at next Sample location. 15" to sand. ~~5~~ of Armor. Only 1 inch of Sand encountered. Marking measuring on Barrel of Slide hammer 28" to install the medium depth Sample point. Joel drives the point to the tape (on the Barrel), disconnects the hammer. Measuring Henry Sampler (72" initial). Install Henry Sampler through Barrel. Hold Sampler, Remove Barrel. Clean Barrel w/ paper towel. Clean out of Barrel inside w/ Spray Bottle. Installing plate around Samples. Tightening w/ pliers.

Olivia McGinley

29

Location Lyndhurst, NJ/Passaic River Date 6/5/16

Project / Client

1528: Applying Yellow tape & Zip tie to Sampler. Cutting Sampler with pipe Cutter. Removed portion measures 41". Stickup of Sampler = 3.5" above grade. Depth to Sampler is 27.5". Adding DI water same as before. Joel applies cap w/ pliers.

1535: 23" to geotextile, measured on Rebar. 12" of Native Sediment. Very little Sand, mostly Sediment, Armor, & Sand b/w armors. Measuring and Marking on Slide hammer barrel 41 inches. Point Driven to marking. Barrel Removed & Cleaned. Henry Sampler measures 72". installed through Barrel, Prior to removal. Plate applied/installed, tightened. Red tape & Zip tie applied to base of Sampler above plate. Excess Henry Sampler outer Tube Cut with pipe Cutter. Inner rod raised little then Cut. Outer Rod Cut portion measures 28.5". Stickup portion measures 3.5". Tube filled w/ DI water. Capped. Cap tightened w/ Pliers.

1555: Completed, taking water Break.

Olivia McGinley

Rite in the Rain

Location Lyndhurst NJ / Passaic River Date 6/5/16

Project / Client

1608: 12" to Sand, 20.5" to geotextile 17' to armor. Work begins on installing the Duplicate Samplers at 603. Point installed into Barrel. Measuring 20.5" on Barrel Marking depth with tape. Installed point, Removing Barrel from Hammer. 48" Henry Sampler installed through Barrel. Wiped off Sampler & Barrel w/paper towel. Sprayed out Barrel. Installed plate. tightened w/ Pliers. Green Tape & 2 Zipties, Tape tore in half, applied w/ gap b/w the 2 tape Strips, Applied to Henry Sampler. Cutting Sampler w/ pipe Cutter. Cut off portion measures 24.5". Liner tube Raised slightly, Cut off. fill Sampler w/ water. Remaining Portion above grade = 4 inches.

1623: 22" to geotextile. 11" to Sand. 3.5" Sand (encountered @ 14.5"). Armor Mark Barrel @ 24" from tip. Joel hammers in Point to mark on Barrel (tape). Henry Sampler Measured @ 72" initial. Installed thru Barrel to point. Held in place while Barrel is Removed. Barrel was Removed but the Screen was found inside the Barrel. Only the point & Henry Sampler deployed. The Screen did not leave barrel, so Need to install a new point w/ screen. Need to decon Henry Sampler as well (?). Looks like Joel is wiping it down with paper towel from where I stand on

Location Lyndhurst, NJ / Passaic River Date 6/5/16

Project / Client

in the work area. Joel Returns w/ Sampler. Indicates he Rinsed Sampler w/ DI Water.

1637: Joel Begins Probing for a new hole w/ Rebar. Measurements: 21.5 to geotextile, 13" Sediment, ~3" of Sand (16" bags), 5.5" Armor. Marking Barrel w/ tape @ 28.5" from tip. Joel hammers to depth (after a little trouble hammering into Armor Stone). Installs Sampler thru Barrel. Holds in place & Removes Barrel using channel locks to grip the Barrel. Having trouble Removing Barrel Without moving the Sampler. Vice grip pliers used on Henry Sampler above barrel to try and deploy point from Barrel. Sampler Removed from Barrel, tried using T-Bar to Knock out Point. T-Bar too Short. Using excess Tubing Cut earlier to try and Knock out the point. didn't work. Reinstalled sampler to barrel using Vice-grip pliers to hold and Pulling on Barrel. Didn't work. Abandoned point. Cleaning Sampler again, getting another point. Spraying out the Barrel again.

1654: 13" to Sand, 20.5 to geotextile, 17' to armor. Starting at a brand new location to attempt the next location. Previous Two attempts

Christy

32

Location Lyndhurst, NJ / Passaic River Date 6/5/16

Project / Client

were attempted to be installed approximately same location. Now installing ~7" away from last attempt.

1657: Screen from 2nd attempt became lodged in Barrel shoe, thus difficulty deploying it. Don't think Jammed screen is from earlier (Green Dup) because the screen from first attempt @ yellow dup came out of shoe whole, just did not deploy. Replacing shoe imminent.

1703: 11" to Sand, 20.5" to geotextile, 14.5" to Armor. Drove Barrel to depth after marking. Installed sampler. Removed Barrel keeping Sampler Steady. Installed Plate. Tightened Plate. Applied 2 yellow tapes & 2 yellow Zip Ties. Cuts pipe. Raises & Cuts inner rod w/ Bolt Cutters. Cut off portion measures 41". filling w/ water the Sampler as Before. Remainder of Sampler above grade is 4". Not Certain Water filled up the Sampler. Was Still accepting Water when Capped, but 4+ full Syringes of water were accepted before Capping. Cap applied & Tightened with pliers.

1715: Beginning final Duplicate Sampler installation (Deep). 21.5" to fabric. 14" to Sand. 16.5" to Armor.

Chris Moyant

33

Location Lyndhurst, NJ / Passaic River Date 6/5/16

Project / Client

1716: Tip installed. Point Driven to mark on Barrel (39.5"). Resistance encountered in Armor layer so point installed at an angle (approximately 75°). Henry Sampler (72") installed into Barrel. Barrel Removed. Plate installed. Tightened w/ pliers. Tape & Zipties (2x each) (Red) applied to Sampler tube. Tube Cut, measures 29". inner Rod cut down. 5" above plate remains. The final sample point did not take much water into the Sample tube when water was applied. (<1 syringe full). Cap applied & tightened. Location Complete.

17:48 Work done. Decon'ed Waders. CM leaves Site.

Chris Moyant

Rite in the Rain